

HOST PLANT AND SEASONAL ABUNDANCE OF *BACTROCERA VISENDA* (HARDY) (DIPTERA: TEPHRITIDAE)

J. ROYER¹ and B. DOSTIE²

¹Queensland Department of Primary Industries, PO Box 652, Cairns, Qld 4870

²Queensland Tropical Public Health Unit, PO Box 1103, Cairns, Qld 4870

Abstract

Host plant records from northern Queensland suggest that *Bactrocera visenda* (Hardy) is monophagous on *Garcinia warrenii* (native mangosteen: Clusiaceae). Populations of *B. visenda* increased markedly from November to February annually, which correlates well with the fruiting period for *G. warrenii*. Almost all *G. warrenii* fruit collected produced *B. visenda*, which was not reliably reared from any other host. A record from *G. gibbsiae* remains unconfirmed. *B. visenda* was not reared from cultivated mangosteen (*G. mangostana*) and is unlikely to become an economic pest of cultivated fruit in this region.

Introduction

An increasing variety of native and tropical fruit is being grown in northern Queensland, but the pest status of many endemic rainforest fruit flies remains unknown. As part of the Papaya Fruit Fly Eradication Campaign (1995-99), an extensive trapping and fruit collection survey was conducted to establish breeding sites and host fruits of *Bactrocera papayae* Drew & Hancock and other fruit flies. *Bactrocera visenda* (Hardy) was found to be one of the most frequently trapped fruit flies yet, despite its abundance, comparatively little is known about its biology. Two hosts, *Garcinia warrenii* and *G. gibbsiae* (Clusiaceae) have been reported previously (May 1957, 1960, Drew 1989). An earlier record from *G. kajewskii* (Hardy 1951) almost certainly refers to *G. warrenii* (Hancock *et al.* 2000). There is no information on the importance of these hosts to *B. visenda*, nor on any changes in its seasonal abundance.

Methods

Trapping

During the eradication campaign, *B. papayae* populations were monitored using Steiner traps baited with methyl eugenol lures. Trap placement was on a 1 km grid where eradication treatments were intensive, and at 5-10 km intervals in more remote areas. Traps were cleared weekly and their contents identified. Most traps were checked only for the presence of *B. papayae*. However, selected traps in rainforest areas and study areas had all fruit flies counted and identified to species and these provided data on *B. visenda*.

Fruit Collecting

As an adjunct to lure trapping, a project was initiated during the eradication campaign to elucidate the host fruit range of *B. papayae* and other fruit flies. Fruit was collected from farms, orchards, suburban yards, rainforest and produce markets. Fruit samples were held in a laboratory under controlled temperature (27°C) and humidity (70%) until fruit flies emerged. After emergence, fruit flies were left for a further 7 days to mature and colour, then

killed in a freezer. Fruit flies were then identified, with numbers of each species, host fruit and collection location being recorded.

Results

From January 1996 to March 1998 a total of 101,538 *B. visenda* was obtained from 22,852 trap samples. The seasonal abundance pattern for *B. visenda* is given in Fig. 1 and shows a marked increase between December and February annually. This coincides with the known fruiting pattern of *G. warrenii* (Cooper and Cooper 1994).

Fruit of four species of *Garcinia* was collected, but *B. visenda* was recovered only from *G. warrenii* (Table 1). *G. mangostana*, the only commercially grown mangosteen, produced no *B. visenda* during this study.

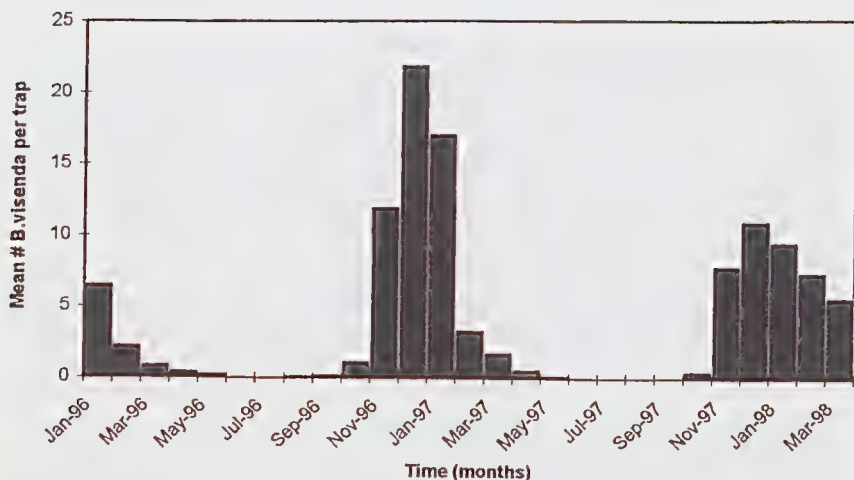


Fig. 1. Seasonal abundance of *Bactrocera visenda* from methyl eugenol traps in northern Queensland.

Discussion

The results indicate that *Bactrocera visenda* is monophagous on *Garcinia warrenii*. There is no evidence to suggest that *G. mangostana* or any other mangosteens surveyed are hosts of *B. visenda*. May (1960) recorded *G. gibbsiae* as a host, but the reliability of this report is unknown and it requires confirmation (D.L. Hancock, pers. comm.). *G. gibbsiae* was not collected during the survey and this record remains unconfirmed. May (1957) indicated that *G. gibbsiae* is a major host of *B. expandens* (Walker), which was reared from *G. dulcis* but not from *G. warrenii* during the survey.

Garcinia gibbsiae fruits from July to January, whereas *G. warrenii* fruits primarily from October to January (Cooper and Cooper 1994). *B. visenda* were reared between September and March and the seasonal increase in adult abundance (Fig. 1) correlates well with the fruiting period of *G. warrenii*. As very low numbers of adults were collected in lure traps between May and October, it is possible that *B. visenda* overwinters as largely non-lure responding (and non-breeding) adults in moist, shady forest areas.

Table 1. Fruit fly rearing data from *Garcinia* spp.

| <i>Garcinia</i> species | No. of samples collected | No. of samples that produced fruit flies | No. of samples that produced <i>B. visenda</i> |
|-------------------------|--------------------------|--|--|
| <i>G. mangostana</i> | 75 | 3 | 0 |
| <i>G. dulcis</i> | 60 | 8 | 0 |
| <i>G. xanthochymus</i> | 2 | 0 | 0 |
| <i>G. warrenii</i> | 68 | 66 | 66 |

References

- COOPER, W. and COOPER, W.T. 1994. *Fruits of the rainforest. A guide to fruits in Australian tropical rainforest*. RD Press, Surry Hills; 327 pp.
- DREW, R.A.I. 1989. The tropical fruit flies (Diptera: Tephritidae: Dacinae) of the Australasian and Oceanian Regions. *Memoirs of the Queensland Museum* 26: 1-521.
- HANCOCK, D.L., HAMACEK, E.L., LLOYD, A.C. and ELSON-HARRIS, M.M. 2000. *The distribution and host plants of fruit flies (Diptera: Tephritidae) in Australia*. Queensland Dept. of Primary Industries Information Series Q199067, Brisbane; iii + 75 pp.
- HARDY, D.E. 1951. The Krauss collection of Australian fruit flies (Tephritidae-Diptera). *Pacific Science* 5(2): 115-189.
- MAY, A.W.S. 1957. Queensland host records for the Dacinae (fam. Trypetidae). First supplementary lists. *Queensland Journal of Agricultural Science* 14: 29-39.
- MAY, A.W.S. 1960. Queensland host records for the Dacinae (fam. Trypetidae). Second supplementary lists. *Queensland Journal of Agricultural Science* 17: 195-200.